

# CONTENTS OF VOLUME 11

## No. 1

PAGE

TH. N. ZWIETERING: The degree of mixing in continuous flow systems .. .. .	1
M. LORENZ and A. H. EMERY: The packed thermal diffusion column .. .. .	16
J. M. OELDERIK and H. I. WATERMAN: Influence of the structure of a silico-tungstic acid on silica gel catalyst on catalytic activity .. .. .	24
J. J. VAN ROSSUM: Experimental investigation of horizontal liquid films: wave formation, atomization, film thickness .. .. .	35
D. B. SPALDING: The stability of steady exothermic chemical reactions in simple non-adiabatic systems .. .. .	53
W. A. DEKKER, E. SNOECKE and H. KRAMERS: The rate of absorption of $\text{NO}_2$ in water .. .. .	61
Selection of Current Papers of Interest to Chemical Engineers .. .. .	72
Selection of Current Soviet Papers of Interest to Chemical Engineers .. .. .	73
Book Reviews:	
"Advances in Chemical Engineering Vol. 2" edited by T. B. DREW and J. W. HOOPER (reviewed by H. KRAMERS)	75
"Second symposium on coal preparation (University of Leeds)" (reviewed by M. J. G. WILSON) .. .. .	76
"Automatic measurement of quality in process plants (Proceedings of Conference sponsored by the Society of Instrument Technology)" (reviewed by W. L. WILKINSON) .. .. .	76
"Chemical processing of nuclear fuels" by F. S. MARTIN and G. L. MILES (reviewed by S. HARTLAND) .. .. .	76
"Scale up in practice" edited by R. FLEMING (reviewed by M. W. THRING) .. .. .	77
"Vapour-liquid equilibrium" by E. HALA, J. PICK, V. FRIED and O. VILIM, translated by G. STANDART (reviewed by R. L. PIGFORD) .. .. .	78
Announcements .. .. .	80

## No. 2

T. K. SHERWOOD and J. M. RYAN: Mass transfer to a turbulent fluid with and without chemical reaction .. .. .	81
K. C. R. CHOWDHURY and W. FRITZ: Sinkversuche mit isometrischen Teilchen in Flüssigkeiten .. .. .	92
S. R. M. ELLIS and M. RAZAVIPOUR: Vapour-liquid equilibria at reduced pressures: <i>n</i> -butanol-ethyl benzene; aniline- <i>p</i> -cymene .. .. .	99
R. B. BIRD and C. F. CURTIS: Tangential Newtonian flow in annuli—I. Unsteady state velocity profiles .. .. .	108
R. B. BIRD, C. F. CURTIS and W. E. STEWART: Tangential Newtonian flow in annuli—II. Steady state pressure profiles .. .. .	114
H. C. VAN NESS: Precise testing of binary vapour-liquid equilibrium data by the Gibbs-Duhem equation .. .. .	118
P. G. SAFFMAN: Dispersion in flow through a network of capillaries .. .. .	125
N. A. WARNER: Gas-phase mass-transfer in a disk column .. .. .	130
Book Reviews:	
"Chemical engineering practice" edited by H. W. CREMER and T. DAVIES (reviewed by E. S. SELLERS) .. .. .	138
"Low temperature physics and chemistry" edited by J. R. DILLINGER (reviewed by B. F. DODGE) .. .. .	139
"Metallurgical thermochemistry" (third edition revised) by O. KUBASCHIEWSKI and E. L. EVANS (reviewed by B. C. H. STEELE) .. .. .	139
"Electrochemical processes in chemical industries" by A. REGNER (reviewed by J. G. HOOGLAND) .. .. .	139
"Kernverfahrenstechnik. Eine Einführung für Ingenieure" by W. MIALKI (reviewed by K. JAROSCHER) .. .. .	140
Book Received .. .. .	140
Selection of Current Papers of Interest to Chemical Engineers .. .. .	141
Selection of Current Soviet Papers of Interest to Chemical Engineers .. .. .	143
Errata .. .. .	148

## No. 3

PAGE

N. A. WARNER: Liquid metal irrigation of a packed bed .. .. .	149
N. A. WARNER: The absorption of zinc vapour in molten lead counter-current absorption in a packed column .. .. .	161
D. B. SPALDING: Conserved-property diagrams for rate-process calculations - Part I. Comparison of known diagrams .. .. .	188
R. ARIS: The longitudinal diffusion coefficient in flow through a tube with stagnant pockets ..	194
D. J. NEMANIC, J. W. TIERNEY, R. ARIS and N. R. AMUNDSON: An analysis of chemical reactor stability and control—IV. Mixed derivative and proportional control .. .. .	199
A. H. NISSAN and F. C. HAAS: The hydrodynamics of flow between horizontal concentric cylinders—II. Generalized criteria and correlation of heat and transfer data .. .. .	207
H. GROOTHUIS and W. P. HENDAL: Heat transfer in two-phase flow .. .. .	212
Book Review:	
"1958 Heat Transfer and Fluid Mechanics Institute." Preprints of papers held at University of California (reviewed by J. O. WILKES)	221
Books Received .. .. .	221
Selection of Current Papers of Interest to Chemical Engineers .. .. .	222
Selection of Current Soviet Papers of Interest to Chemical Engineers .. .. .	223

## No. 4

D. B. SPALDING: Conserved property diagrams for rate process calculations—Part II .. ..	225
W. C. RAGSDALE and J. M. SMITH: Heat transfer in nozzles .. .. .	242
A. G. FREDRICKSON: Helical flow of an annular mass of visco-elastic fluid .. .. .	252
A. KLINKENBERG and A. HARMENS: Unsteady state heat transfer in stationary packed beds ..	260
F. C. EVERSTEIJN, J. M. STEVELS and H. I. WATERMAN: The viscosity of liquids as a function of temperature .. .. .	267
H. A. VREEDENBERG: Heat transfer between a fluidized bed and a vertical tube .. .. .	274
J. HAPPEL and P. A. AST: The motion of a rigid sphere in a frictionless cylinder .. .. .	286
Letters to the Editors:	
G. VAN DEN BERG: Note in connexion with the paper: Kinetics of water-gas conversion reaction by P. BORTOLINI ( <i>Chem. Engng. Sci.</i> 1958 9 135) .. .. .	293
P. BORTOLINI: Reply to the letter from Dr. C. VAN DEN BERG .. .. .	293
Selection of Current Papers of Interest to Chemical Engineers .. .. .	294
Selection of Current Soviet Papers of Interest to Chemical Engineers .. .. .	295

## Author Index

(B) denotes book review

(L) denotes Letter to the Editors

AMUNDSON, N. R. p. 199	HARTLAND, S. p. 76 (B)	SMITH, J. M. p. 242
ARIS, R. pp. 194, 199	HENDAL, W. P. p. 212	SNOECKE, E. p. 61
AST, P. A. p. 286	HOOGLAND, J. G. p. 139 (B)	SPALDING, D. P. pp. 53, 183, 225
BIRD, R. B. pp. 108, 114	JAROSCHEK, K. p. 140 (B)	STEELE, B. C. H. p. 139 (B)
BORTOLINI, P. p. 293 (L)	KLINKENBERG, A. p. 260	STEVELS, J. M. p. 267
CHOWDHURY, K. C. R. p. 92	KRAMERS, H. pp. 61, 75 (B)	STEWART, W. E. p. 114
CURTISS, C. F. pp. 108, 114	LORENZ, M. p. 16	THRING, M. W. p. 77 (B)
DEKKER, W. A. p. 61	NEMANIC, D. J. p. 199	TIERNEY, J. W. p. 199
DODGE, B. F. p. 139 (B)	NISSAN, A. H. p. 207	VAN DEN BERG, G. p. 293 (L)
ELLIS, S. R. M. p. 99	OELDERIK, J. M. p. 24	VAN NESS, H. C. p. 118
EMERY, A. H. p. 16	PIGFORD, R. L. p. 78 (B)	VAN ROSSUM, J. J. p. 35
EVERSTEIJN, F. C. p. 267	RAGSDALE, W. C. p. 242	VREEDENBERG, H. A. p. 274
FREDRICKSON, A. G. p. 252	RAZAVIPOUR, M. p. 99	WARNER, N. A. p. 130, 149, 161
FRITZ, W. p. 92	RYAN, J. M. p. 81	WATERMAN, H. I. pp. 24, 267
GROOTHUIS, H. p. 212	SAFFMAN, P. G. p. 125	WILKES, J. O. p. 221 (B)
HAAS, F. C. p. 207	SELLERS, E. S. p. 138 (B)	WILKINSON, W. L. p. 76 (B)
HAPPEL, J. p. 286	SHERWOOD, T. K. p. 81	WILSON, M. J. G. p. 76 (B)
HARMENS, A. p. 260		ZWIETERING, Th. N. p. 1

VOL  
11  
1959

VOL.  
11  
59/60